

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A method for the non-invasive early detection of colon cancer ~~and/or~~ intestinal cancer precursor cells by means of mutational analysis of the genes for APC, K-ras, β -catenin and B-raf in a sample, characterized in that the method comprises the following steps:
 - collecting a stool ~~and/or tissue~~ sample,
 - homogenizing the sample,
 - obtaining DNA from the sample,
 - performing an amplification reaction in the genes for APC, K-ras, β -catenin and B-raf,using the primers
s1 ——— TTGCAGTTATGGTCAATACCC SEQ ID NO. 1
as1 ——— GTGCTCTCAGTATAAACAGGATAAG SEQ ID NO. 2
s2 ——— CCTCAAAAGGCTGCCACTTG SEQ ID NO. 3
as2 ——— CTGTGACACTGCTGGAAC TTCG SEQ ID NO. 4
s3 ——— AGCACCCCTAGAACCAAATCCAGCAG SEQ ID NO. 5
as3 ——— TGGCATGGTTTGTCCAGGGC SEQ ID NO. 6
s4 ——— ACAAACCATGCCACCAAGCAGA SEQ ID NO. 7
as4 ——— GAGCACTCAGGCTGGATGAACAAG SEQ ID NO. 8
s5 ——— TTCCAGATGCTGATACTTTA SEQ ID NO. 9
as5 ——— CTGAATCATCTAATAGGTCC SEQ ID NO. 10
for APC, the primers
s ——— CTGGTGGAGTATTTGATAGTG SEQ ID NO. 11
as ——— TCTATTGTTGGATCATATTC SEQ ID NO. 12
for K-ras, the primers
s ——— CTGATTTGATGGAGTTGGAC SEQ ID NO. 13
as ——— CTTGAGTGAAGGACTGAGA SEQ ID NO. 14
for β -catenin, and the primers

s ~~————~~ TGTATCACCATCTCCATATC SEQ ID NO. 17

as ~~————~~ GCATTCTGATGACTTCTGGT SEQ ID NO. 18

for B-raf,

wherein amplification products are formed, and

- performing a mutational analysis in the amplification products.

2. (Original) The method according to claim 1, characterized in that the detection of mutations in selected sections of the genes for APC, K-ras, β -catenin and B-raf is effected by means of a DNA chip, said DNA chip including probes for APC, K-ras, β -catenin and B-raf from those regions of the above-mentioned genes that are flanked by the primer sequences specified in claim 1.
3. (Currently Amended) The method according to claim 1 ~~or 2~~, characterized in that the APC, K-ras, β -catenin and B-raf genes are accumulated from total DNA by hybridizing sequence-specific biotinylated oligonucleotides with the genes for APC, K-ras, β -catenin and B-raf using coupling of the biotin residue to streptavidin and subsequent separation via magnetic particles.
4. (Currently Amended) The method according to claims 1 ~~to 3~~, characterized in that amplification products, especially PCR products, are separated in an agarose gel for control purposes prior to purification.
5. (Currently Amended) The method according to ~~any of~~ claims 1 ~~to 4~~, characterized in that the mutational analysis of the PCR products is effected using electrophoretic techniques, preferably SSCP, alternatively by means of a chromatographic procedure, preferably an HPLC-based procedure.
6. (Currently Amended) The method according to ~~the preceding claim~~ claim 5, characterized in that detected mutagenic conformations of a single strand are isolated and optionally sequenced.

7. (Currently Amended) Primer sequences selected from the group comprising:
the primers

s1 ——— TTGCAGTTATGGTCAATACCC SEQ ID NO. 1
as1 — GTGCTCTCAGTATAAACAGGATAAG SEQ ID NO. 2
s2 ——— CCTCAAAAGGCTGCCACTTG SEQ ID NO. 3
as2 — CTGTGACACTGCTGGAACCTTCGC SEQ ID NO. 4
s3 ——— AGCACCCCTAGAACCAAATCCAGCAG SEQ ID NO. 5
as3 — TGGCATGGTTTGTCCAGGGC SEQ ID NO. 6
s4 ——— ACAAACCATGCCACCAAGCAGA SEQ ID NO. 7
as4 — GAGCACTCAGGCTGGATGAACAAG SEQ ID NO. 8
s5 ——— TTCCAGATGCTGATACTTTA SEQ ID NO. 9
as5 — CTGAATCATCTAATAGGTCC SEQ ID NO. 10

or alternatively

s2 ——— GAATCAGCTCCATCCAAGT SEQ ID NO. 15
as2 — TTTCTGCTATTTGCAGGGT SEQ ID NO. 16

for APC, the primers

s ——— CTGGTGGAGTATTTGATAGTG SEQ ID NO. 11
as ——— TCTATTGTTGGATCATATTCG SEQ ID NO. 12

for K-ras, the primers

s ——— CTGATTTGATGGAGTTGGAC SEQ ID NO. 13
as ——— CTTGAGTGAAGGACTGAGAA SEQ ID NO. 14

for β -catenin, and the primers

s ——— TGTATCACCATCTCCATATC SEQ ID NO. 17
as ——— GCATTCTGATGACTTCTGGT SEQ ID NO. 18

for B-raf.

8. Canceled.

9. (Currently Amended) A kit, comprising primers selected from the group comprising:
the primers

s1 ——— TTGCAGTTATGGTCAATACCC SEQ ID NO. 1
as1 — GTGCTCTCAGTATAAACAGGATAAG SEQ ID NO. 2
s2 ——— CCTCAAAAGGCTGCCACTTG SEQ ID NO. 3
as2 — CTGTGACACTGCTGGAACCTTCGC SEQ ID NO. 4
s3 ——— AGCACCCCTAGAACCAAATCCAGCAG SEQ ID NO. 5
as3 — TGGCATGGTTTGTCCAGGGC SEQ ID NO. 6

s4 ——— ~~ACAAACCATGCCACCAAGCAGA~~ SEQ ID NO. 7

as4 — ~~GAGCACTCAGGCTGGATGAACAAG~~ SEQ ID NO. 8

s5 ——— ~~TTCAGATGCTGATACTTTA~~ SEQ ID NO. 9

as5 — ~~CTGAATCATCTAATAGGTCC~~ SEQ ID NO. 10

or alternatively

s2 ——— ~~GAATCAGCTCCATCCAAGT~~ SEQ ID NO. 15

as2 — ~~TTTCTGCTATTTGCAGGGT~~ SEQ ID NO. 16

for APC, the primers

s ——— ~~CTGGTGGAGTATTTGATAGTG~~ SEQ ID NO. 11

as ——— ~~TCTATTGTTGGATCATATTCG~~ SEQ ID NO. 12

for K-ras, the primers

s ——— ~~CTGATTTGATGGAGTTGGAC~~ SEQ ID NO. 13

as ——— ~~CTTGAGTGAAGGACTGAGAA~~ SEQ ID NO. 14

for β -catenin, and the primers

s ——— ~~TGTATCACCATCTCCATATC~~ SEQ ID NO. 17

as ——— ~~GCATTCTGATGACTTCTGGT~~ SEQ ID NO. 18

for B-raf,

and optionally information relating to combining the contents of the kit.

10. Canceled.

11. (New) A method for the detection of colon cancer or colon cancer precursor cells using the kit according to claim 9.